HONOLULU

LA JOLLA

TIBURON

SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - FEBRUARY 1976

RESEARCH HIGHLIGHTS

	Page
Publications	1
Studies Begun on Effect of Temperature on Speed of Contraction of Red and White Muscles of Tuna	3
Apparatus Completed to Test Sustained Swimming Abilities and Active Metabolic Rate of Tuna.	3
Report Completed on Albacore Trolling Exploration Across Northern Pacific in 1975	6
Studies of Microscale Distribution of Larval Fish Food Organisms to be Conducted on Multiship Cruise	13
INP-CalCOFI Egg and Larva Subcommittee Makes Recommendations for Cooperative Research Program in 1978	15
Center Director Chairs Meeting of NMFS Tuna Policy Committee	17
Statistical Experts Examine Methodology for Comparison of Porpoise Mortality	20
NOAA Research Vessel Jordan Rescues Native Fishermen off Costa Rica	21
NMFS-Tuna Industry Cooperate in Tests of Porpoise Saving Gear and Methods	22
Two NOAA Research Vessels Complete Survey of Porpoise Distributions	22

NOAA/NMFS

SOUTHWEST FISHERIES CENTER
La Jolla, California

Honolulu Laboratory
La Jolla Laboratory
Tiburon Laboratory

MONTHLY REPORT - FEBRUARY 1976

STATUS OF PUBLICATIONS

Published

Perrin, William F. 1975. Variation of spotted and spinner porpoise (genus Stenella) in the eastern Pacific and Hawaii. Bull. Scripps Inst. Oceanogr., Univ. Calif., Univ. Calif. Press, 21, 206 p.

Spotted and spinner porpoise occur in coastal and offshore tropical waters of the eastern and central Pacific, as well as elsewhere in world tropical waters. They are important in the tropical yellowfin tuna fishery as indicators and aggregators of tuna. In the eastern Pacific, the range of both is a triangle with the base the coastline from Cabo San Lucas, Mexico to Columbia, and the apex extending seaward to about 10° N latitude, 145° W longitude.

Variation owing to ontogeny, sexual dimorphism, individual variation, and geographical differentiation in coloration, external size and shape, and skeleton are described in qualitative and quantitative terms, and three geographical races of the spotted porpoise, Stenella attenuata (Gray, 1846), and four of the spinner porpoise, S. longirostris (Schlegel, 1841), (nomenclature is provisional) are defined.

Struhsaker, Paul and Howard O. Yoshida. 1975. Exploratory shrimp trawling in the Hawaiian Islands. Mar. Fish. Rev. 37(12): 13-21. (MFR Paper 1169.)

The results of exploratory shrimp trawling in the Hawaiian Islands during six cruises of the R/V Townsend Cromwell are given. One species of shrimp, Penaeus marginatus, was found in quantities

This report does not constitute publication and is for information only.

thought sufficient to sustain a small trawl fishery. Average catches in the four most productive areas ranged from 4.7 to 31.0 lb (2.1 to 14.1 kg) per hour (heads-on weight) with a single 41-ft (12.5 m) shrimp trawl. Small amounts of shrimps of the genera Heterocarpus, Aristeus, Pandalus, and Pleisioneka were taken in depths of 150 to 385 fm (275 to 705 m), but never in quantities sufficient to justify the sorting effort required.

Approved by Center Director

"Diel changes in swim-bladder inflation of the larvae of the northern anchovy, Engraulis mordax Girard" by John R. Hunter and Carol Sanchez. For publication in the Fishery Bulletin, U.S.

"Minimum swimming speed of albacore, Thunnus alalunga (Bonnaterre)" by Ronald C. Dotson. For publication in the Fishery Bulletin, U.S.

Translation

Uyemae, Junichiro. 1975. The economy of the tuna fishery in Japan (Nipponjin to maguro no keizaigaku). Bungei Shunju, August 1975, p. 340-350. (Translated from Japanese by Tamio Otsu, 1976, 11 p., Translation No. 13.)

HONOLULU LABORATORY

FISH ENVIRONMENT INVESTIGATIONS

February Progress Report by Leader of Recreational Fisheries Program

Fishery Biologist Heeny Yuen started a manuscript on the night handline fishery for tunas (ika-sibi) of Hilo, Hawaii. Auction records relating to the sales of tunas from this fishery for 1973 and 1974 were received; data for 1975 having been obtained earlier. Extraction of data from the records and the processing of the data is now going on. Mr. Yuen also spent time planning and preparing for two tracking ventures: tracking of yellowfin tuna in cooperation with the HIATT (Hawaiian International Allison Tuna Tournament) Committee, and tracking of large skipjack tuna. The former is scheduled for early April and the latter for May-June.

* * * * * * * * * * * *

During February, the staff of the Experimental Ecology of Tunas under the direction of Dr. Andrew Dizon initiated an experiment designed to test why tuna are hot, completed an apparatus to test sustained swimming abilities and active metabolic rate of tuna, tested a model of an aeration device for Kewalo Basin water, and made progress toward full operation of the behavioral thermoregulation tank.

Studies Begun on the Effect of Temperature on the Speed of Contraction of Red and White Muscles of Tuna

Recent studies by C. S. Wardle (Nature 225: 725-727, 1975) have shown a significant effect of temperature on the speed of contraction of isolated muscle samples from several species of marine teleosts. The changes in speed of contraction, in turn, reflect the effects of temperature on the maximum swimming speed of these species. Mr. Richard Brill, graduate student, Department of Physiology, University of Hawaii, has therefore recently begun similar studies at the Kewalo Research Facility in Honolulu using isolated blocks of red and white tuna muscle.

The technique involves impaling the muscle blocks on stainless steel stimulating electrodes. The speed of contraction is monitored by an isotonic optical sliding wedge transducer which is connected to a storage oscilloscope. The muscle is kept in a controlled temperature bath.

Tests of the effect of temperature on red and white muscle samples from both kawakawa, Euthynnus affinis, and skipjack tuna, Katsuwonus pelamis, are planned.

Sustained Swimming and its Energetic Costs to be Measured in Swim Channel

Scientists at the Honolulu Laboratory have previously determined the relative energetic costs of maintaining basal swimming velocities in skipjack, yellowfin, and kawakawa. For most models of energy flow through an organism, the energetic costs of day-to-day activity are estimated at two to three times that of basal metabolism. Because tuna are unique in many physiological aspects, this convention must be tested. To test metabolism at greater than basal activity states, a current is usually provided for the fish to swim against while oxygen consumption is measured. Because tuna can swim so fast, currents required are difficult to generate without a great deal of turbulence. In lieu of the commonly used swimming tube, a small, above-ground swimming pool (18 ft in diameter) will be partitioned with a circular fiber glass insert to provide a 1 x 1.5 m swim channel. A hydraulic system driving a rotating arm, moving at a chosen speed will chase (or lead) a tuna to

swim at a fixed velocity. Using a mineral oil seal, the apparatus becomes a respirometer. The experimental apparatus, designed by Sherry Steffel, graduate student, Laboratory of Limnology, University of Wisconsin and Donald Aasted of the Honolulu Laboratory is now in the final stages of assembly and painting. The tank and the insert walls are on hand and experimentation should soon start.

The goals are: 1) measurement of sustained swimming times at various speeds; 2) determination of the relationship of swimming speed and oxygen consumption (active respiration); and 3) contribution of anaerobic metabolism (white muscle contribution) to total energy needs in fast swimming tuna.

Model of Improved Sea Water Aeration Device Tested

Due to the nature of the existing aeration system, dissolved oxygen in the sea water at the Kewalo Research Facility only reaches 80% saturation and the volume of water flow is about 60% of the pump's potential. A "U-tube" aeration device should bring the dissolved oxygen level and the pump volume to 100%. To test the device, a model handling one-tenth the capacity of our actual needs was designed by Randolph Chang and put into use. The model is simply a "U"-shaped tube, set vertically, 33 ft (or 1 atmosphere) tall. Water enters at the top of the U", flows downward and returns to initial altitude. A venturi was used to inject air at the top of the tube and the flow rate was adjusted between 24 and 50 gpm. The water flow entrains the air and carries the bubbles downward to one atmosphere pressure where oxygen solubility is increased.

* * * * * * * * * * * *

During calibration of the behavioral thermoregulation tank, two small problems were discovered in the control system. Both were corrected and the tank was run with all subsystems working properly. If all goes well, plans are to test the first fish in early March.

TUNA ASSESSMENT AND DEVELOPMENT INVESTIGATIONS

Laboratory Roles in Global Tuna Studies Discussed

During Dr. W. Fox's visit to the Honolulu Laboratory in mid-February, discussions were held between Drs. Robert Skillman, Leader, Tuna Monitoring and Assessment, Jerry Wetherall, Leader, Population Dynamics of North Pacific Albacore, and William Fox, Chief, Oceanic Fisheries Division, Southwest Fisheries Center, regarding various aspects of the SWFC's Global Tuna Studies. Discussions centered around

the acquisition and storage of fishery data and assessment of tuna stocks by ocean area and species of tunas. A document covering priorities and time scheduling for species of fishery specific studies to be performed by the Honolulu Laboratory is now being developed.

* * * * * * * * * * * *

Fishery Biologist Richard Uchida gathered information on the biology and present status of stocks of major tunas, billfishes, and small tunas in the Indian Ocean and prepared short summaries giving the distribution, availability and abundance, maturation and spawning, subpopulation and migration, and population dynamics and stock assessment to be included in a paper by Richard S. Shomura and Richard N. Uchida entitled "Pelagic fishes and fisheries of the Indian Ocean." Laboratory Director Mr. Shomura will present this paper at the Biological Seminar of the Cooperative Investigations in the north and central Western Indian Ocean to be held in Nairobi, Kenya, March 25-April 1.

* * * * * * * * * * * *

Mr. Uchida also started revision of his manuscript "Status of knowledge on the biology and resources of the frigate mackerel, genus Auxis," and Dr. Skillman worked on revising "The biology, ecology, and resources of the skipjack tuna, Katsuwonus pelamis" by Walter M. Matsumoto and Robert A. Skillman. Both manuscripts were prepared as background documents for the FAO Ad Hoc Committee's review of the biology and status of stocks of small tunas.

* * * * * * * * * * * *

Research Assistant James Uchiyama prepared more than 150 otolith specimens from fishes collected during the Townsend Cromwell's recent cruise to the northwestern Hawaiian Islands. It appears that the majority of the species collected can be aged by examination of daily growth increments.

* * * * * * * * * * * *

Research Assistant Thomas Kazama has sent most of the caridean and penaeid shrimp specimens in the Honolulu Laboratory's collections to Dr. Isabel Perez Farfante at the NMFS Systematics Laboratory. He also sent all of the stomatopods to Dr. Raymond Manning, U.S. National Museum of Natural History.

February 1976 Catch of Skipjack Tuna in Hawaiian Fishery Above Long Term February Average

The February catch of skipjack tuna in the Hawaiian fishery was estimated at 120.3 metric tons (MT), which was 38.9 MT below the catch in February 1975 but 21.4 MT more than the February average for 1948-75.

The catch for the first 2 months of the year was an estimated 277.6 MT, 52.8 MT below last year's catch for the same period and 48.7 MT above the long-term average.

* * * * * * * * * * * *

As reported by Computer Aid Lucille Tsukano, Government of American Samoa employee Pulou Niuatoa recorded the lengths of 700 albacore from 14 vessels during the period January 16 to February 12. He collected 22 sets of catch and effort data. Utilizing data from five vessels, Mrs. Tsukano calculated an average size of 92.5 cm and a catch rate of 1.41 albacore per 100 hooks.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

ALBACORE FISHERIES PROGRAM

Report Completed on Albacore Trolling Exploration Across Northern Pacific in 1975

During the spring of 1975, three U.S. West Coast albacore vessels conducted exploratory fishing operations across the northern Pacific to evaluate the possibilities for jig fishing for albacore in the western North Pacific. In addition to conducting exploratory fishing, the captains of the vessels cooperated with the SWFC's La Jolla Laboratory in carrying out albacore tagging operations, keeping detailed fishing logs, making oceanographic observations, including surface and subsurface temperature measurements, and making synoptic marine weather observations. In return the NMFS made arrangements for vessels to refuel at Midway Island Navy Base.

The captains and crews of the vessels cooperated fully in collecting data and have provided them to Dr. Michael Laurs, Leader of the Albacore Fishery Investigations. Dr. Laurs has now prepared an Administrative Report summarizing the findings made by the vessels. This report, along with a narrative description of the exploratory fishing prepared by a captain of one of the vessels, was distributed this month to west coast albacore fishermen.

According to Dr. Laurs, this is the first time that an attempt has been made by U.S. fishing vessels to evaluate the possibilities for jig fishing for albacore in the western North Pacific. The survey was successful and should potentially be valuable to the U.S. albacore fishing industry. The vessels sailed from San Diego in mid-April 1975,

traveling to Honolulu where they refueled before conducting exploratory fishing along the Hawaiian Archipelago and westward to Midway Island where they refueled. They then resumed exploratory fishing, fishing as far west as 158°25' E, mainly between 34° to 35° N. After refueling at Midway Island for return to the U.S., the vessels followed a northeasternly course fishing south of 40° N.

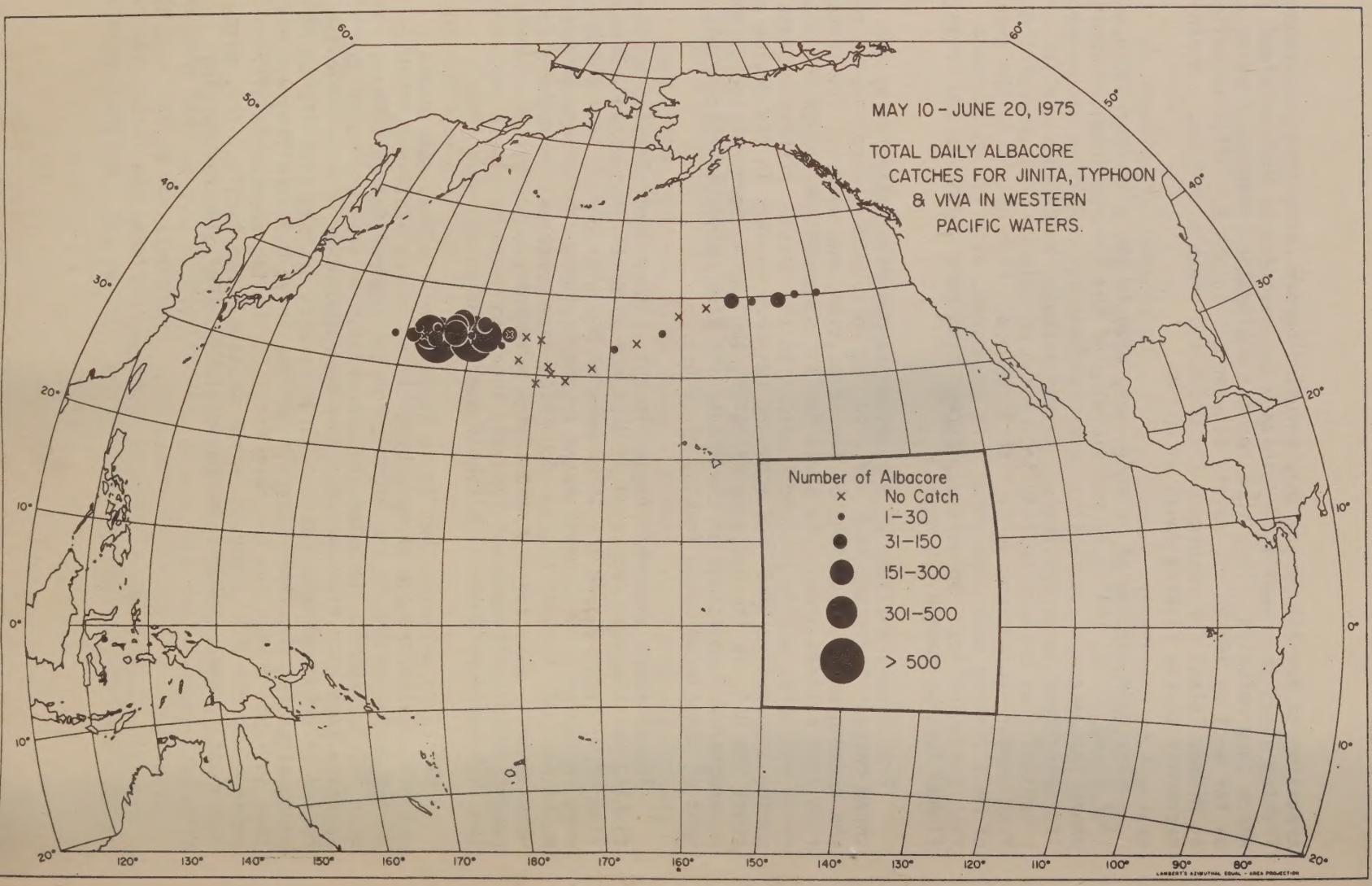
Very good catches of albacore were made in the area near 34° N, 170° E and 34° N, 164° E in the vicinity of the Emperor Seamount chain where the Japanese live bait fishery has been successful in extending its operations in recent years. Figure 1 shows the catches plotted graphically by proportionately increasing dot sizes. The size of the fish caught ranged from about 7 to 35 pounds. Fish caught in the areas of best fishing were from about 8 to 20 pounds, with 12- to 14-pound fish predominating. In general, larger fish were caught as the vessels fished further toward the west.

Preliminary analysis of the oceanographic data collected by the three vessels indicates that the areas of best catches were related to the oceanographic conditions of the Transition Zone waters. The Transition Zone extends across the North Pacific subarctic waters to the north and warm, saline subtropic waters to the south. Fishing success during cooperative NMFS-AFRF albacore research surveys in the region offshore the U.S. in the vicinity of 35° N, 140° W has been related to the oceanographic conditions of the Transition Zone waters and the development of associated ocean frontal structure.

Two albacore that were tagged in the western North Pacific by the fishing vessels were recovered by Japanese live bait fishermen. These fish were tagged during the third week of May near 34° N, 164° E and were recovered about 3 weeks later in the vicinity of the Emperor Seamount near 35° N, 171° E about 400 miles east-northeast from where they were tagged. Assuming a straight line movement and that the fish were caught immediately upon entering the location where they were recovered, the fish moved eastward at slightly over 20 miles per day.

Dr. Laurs believes that it is highly feasible that substantial catches of albacore can be made by trolling in the western North Pacific during spring months in the vicinity of the Emperor Seamount chain near 35° N, 170° E. He bases this conclusion on the results of the Japanese live bait fishery which has been operating in this vicinity during recent years and catching large amounts of "jig size" 12 to 20 pound albacore; the fishing results of the three U.S. trolling vessels that surveyed across the northern Pacific; the tag recoveries of fish released by the U.S. jigboats in the western North Pacific, and, most importantly, the results from the joint NMFS-AFRF albacore tagging program.

Figure 1. Total daily albacore catches for three U.S.jig vessels made during 1975 exploratory fishing survey in western North Pacific and during return to eastern North Pacific to 140°W.



The latter results indicate that during the early portion of the Japanese live bait fishery in March-April, the fish are distributed generally over a broad latitudinal range, roughly 28° to 40° N, within a few hundred miles of the Japanese Islands. As the season advances the fish move eastward in a progressively contracting latitudinal band and near the end of the Japanese live bait fishery in June, the fish appear to follow a narrow, well-defined emigration route extending over a couple degrees of latitude and centered in the Emperor Seamount area at about 35° N, 170° E. The latter conclusion is based on the recovery of 26 tagged fish within very close proximity of each other in the vicinity of the Emperor Seamount within a 3-week period in June 1975, and the recovery of 15 tagged fish in the same area during a 12-day period in mid-June 1974 (Figure 2).

Planning Continues for 1976 Joint NMFS-AFRF Albacore Research

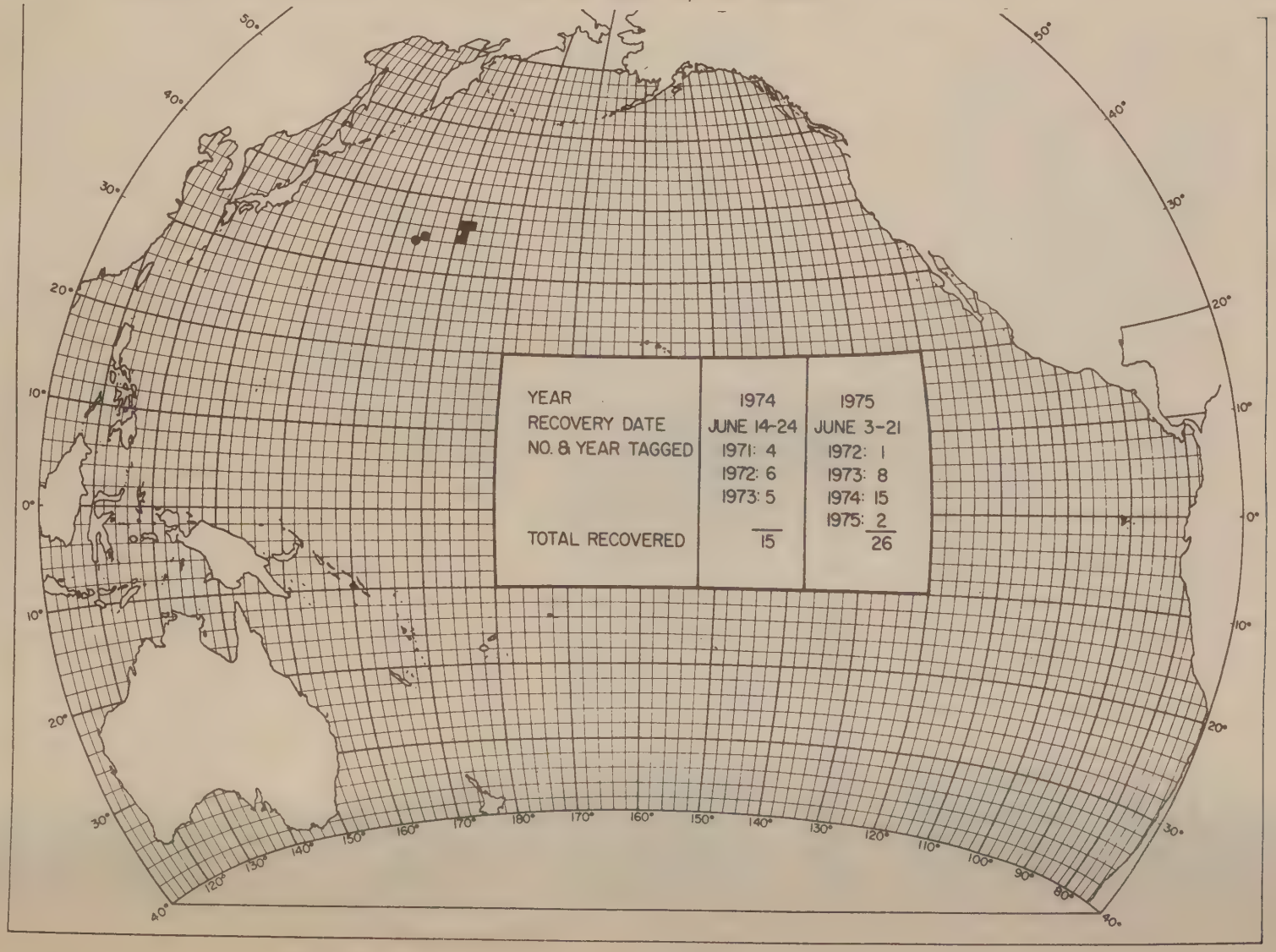
Program Leader Dr. M. Laurs attended the Board of Directors meeting of the American Fishermen's Research Foundation (AFRF) in San Diego to discuss joint NMFS-AFRF albacore research for 1976. It was decided at this meeting that AFRF would charter albacore fishing vessels for three operations: 1) one vessel for exploratory fishing in the western Pacific (contingent upon funding from another source for a second vessel), 2) four vessels to work offshore the U.S. in early season in cooperation with the NOAA research vessel David Starr Jordan, and 3) three vessels to conduct fish scouting/research operations in inshore waters during the 1976 albacore fishing season.

At the request of the Southwest Regional Office and the AFRF, Dr. Laurs attended the Pacific Tuna Development Foundation (PTDF) meeting in Honolulu on February 16 and 17. He made a presentation at the meeting concerning the albacore trolling exploration across the northern Pacific which was conducted by three U.S. albacore jigboats. This was in support of a proposal made to PTDF by the AFRF to support the charter of a jigboat to conduct further exploration in 1976 for albacore in the western Pacific along with one vessel to be chartered by AFRF.

* * * * * * * * * * * *

Mr. R. Lynn has begun planning for the upcoming albacore oceanography cruise on the Jordan in June 1976. The main emphasis of this cruise will be an investigation of the physical processes involved in the frontal boundaries of the Transition Zone waters, especially the subtropic front which has been shown in earlier cruises to be very important in the migration of albacore and their early-season distribution and relative abundance. Dr. Merritt Stevenson and Mr. Forrest Miller of the Inter-American Tropical Tuna Commission will also participate in this cruise. They will work cooperatively in examining the

Figure 2. Recoveries made by Japanese baitboats near Emporer Seamount of albacore tagged by U.S.boats. Dark squares show where tagged fish were recovered in 1974 and 1975. Two dots show where two albacore were tagged by U.S. jig boats in western North Pacific in 1975 and recovered by Japanese in 1975. Insert gives tagging information for recoveries made by Japanese near Emporer Seamount.



feasibility of using satellite observations to monitor the changes in ocean characteristics that influence albacore. Satellite UHRR and multi-spectral observations will be collected from the cruise period and "ground truth" and meteorological data will be collected at sea. Dr. Stevenson has made his entire staff available for the cruise. Dr. Laurs, Mr. Lynn and Dr. Stevenson conducted a planning session and Mr. Lynn wrote a cruise announcement.

Final Data Processing on Albacore-Oceanography Near Completion

Data processing of Cromwell Albacore-Oceanography Cruise 65 is near completion. Messrs. R. Lynn, K. Bliss and R. Dotson of the La Jolla Laboratory obtained final runs on the calibrated STD casts and drafted sections of temperature, salinity, density, and stability. Final point check and contouring is needed. Lynn and Bliss are attempting to complete the STD sections to Hawaii by using XBT's and a mean temperature-salinity relationship. XBT's were used when mechanical problems forced the cancellation of STD casts on eight stations. The technique appears to be only marginally successful.

Work Continued on Albacore Growth Study

After attending the PTDF meeting in Honolulu, Dr. Laurs spent 2-1/2 days working with Dr. Jerry Wetherall of the Honolulu Laboratory on a study they are conducting collaboratively on albacore growth based on data from the joint NMFS-AFRF albacore tagging program. Considerable progress was made in analysis of the growth parameters using standard methods and a new method being developed by Dr. Wetherall to account for the effect of tagging on growth. A significant finding was that geographic variations appear to occur in growth rate of albacore. Albacore taken in the fishery off the Pacific Northwest appear to have a slightly slower growth rate than those taken in the fishery off California. This finding supports Dr. Laurs' hypothesis that the fish which enter the fishery off the Pacific Northwest are separate from the fish which enter the fishery off California. He bases this hypothesis on the pattern of tag returns and on geographic variations in size composition of fish taken in the commercial fishery

* * * * * * * * * * * *

Biological Technician R. Dotson worked with Dr. Gary Sharp of the Inter-American Tropical Tuna Commission on the first draft of a manuscript entitled, "Energy for migration in albacore, Thunnus alalunga (Bonnaterre). Fat reserves in albacore are proposed as an energy source for migration. Fat content of albacore caught offshore and nearshore was estimated from length-mass and density data. Albacore caught nearshore early in the season show a decrease in fat content from offshore values. Calculations were made estimating the distance that could be traveled utilizing this quantity of fat as the only energy source. The manuscript has been sent out for review.

* * * * * * * * * * * *

Albacore logbook records for 1975 were received from California and Washington in the latter part of February. Logbook records from the Oregon Department of Fish and Wildlife are undergoing editing and will be available probably in the latter part of March for processing at the La Jolla Laboratory by Fishery Biologist T. Mulitauaopele for catch-per-unit-effort (CPUE). Charts of albacore CPUE, standardized in terms of 45-ft jigboat by 1° quadrangle and by 15-day period will be prepared and distributed along with logbooks to fishermen before the start of the 1976 albacore fishing season.

STOCK AND RECRUITMENT PROGRAM

Jordan Cruise Planned to Evaluate Impact of Cannibalism by Adult Anchovy on Their Young

Dr. John Hunter, Fishery Biologist at the La Jolla Laboratory, held meetings this month to plan Leg III of the March Jordan cruise. On this cruise, a pilot study will be conducted to evaluate the impact of cannibalism by adult anchovy on their larvae and eggs. The vessel will then proceed to an area containing abundant anchovy schools and a grid will be established to measure the abundance of anchovy larvae and eggs. If these are in abundance, the ship will remain in this area for the 1-week duration of the cruise, sampling eggs and larvae in the day and trawling at night to catch adult anchovy. The stomach contents of the adults will be inspected to determine the incidence of cannibalism.

Laboratory experiments indicated that digestion of eggs and larvae is very rapid. Eggs do not last in the anchovy stomach longer than 4 hours and 4 mm larvae cannot be identified after 2 hours. Thus, in addition to examination of stomach contents, net tows will be taken in front of and behind large schools of anchovy to determine the potential impact of cannibalism. This latter study will be done in cooperation with Tony Koslow, Scripps Institution of Oceanography graduate student, who is interested in the effect on zooplankton communities of grazing by adult anchovy.

In addition to the above activities, collections of larvae will be made to provide material for determining the age of anchovy larvae from otoliths, and for histological diagnosis of starvation. This work requires not only the collection of material but also the testing of various netting, handling and preservation procedures to insure that larvae are in optimal condition for aging and histological diagnosis.

* * * * * * * * * * * *

Dr. A. Alvariño, Fishery Biologist at the La Jolla Laboratory, spent the month of February, by invitation, at the Universidad Nacional Autonoma de Mexico (Mexico City) where she taught a course on "Plankton

and Fisheries" for doctoral candidates at the University. She also supervised a 3-day oceanographic cruise during which her students collected physical and biological data. In addition, Dr. Alvariño presented a lecture on "Predation in the plankton realm" at the headquarters of the Mexican Society of Natural History in Mexico City.

Studies of Microscale Distribution of Larval Fish Food Organisms to be Conducted on Multiship Cruise

Planning for a multiship cruise was continued through this month by Drs. R. Lasker and R. Owen for the study of the horizontal and vertical aggregation of larval fish food organisms. They plan to use a variety of unique methods not heretofore used together on a single cruise. The intent of the study is to delineate on the centimeter scale patches of appropriately-sized food organisms for larval anchovies. Mr. J. Brown, Electronics Technician, has developed a submersible Coulter Counter for this cruise which should be capable of measuring the vertical extent of a patch of dinoflagellates or similarly-sized organisms while the instrument descends through the water column. A surface skimmer has been developed by Dr. E. Scura with associated shipboard diaphragm pump to investigate the importance of the surface as a feeding ground for larval anchovies. The R/V David Starr Jordan will follow a drogue in the Los Angeles Bight pinpointing chlorophyll maximum layers or other patches of phytoplankton and zooplankton. The R/V Townsend Cromwell will be used to ascertain the horizontal extent and vertical distribution of these patches.

* * * * * * * * * * * *

Dr. Lasker has been asked to present the results of his Los Angeles Bight larval fish feeding study at the Joint Oceanographic Assembly Symposium on Oceanography and Fisheries in Edinburgh, Scotland, scheduled for September. A manuscript is being prepared incorporating the information he collected over the past year and a half. The paper to be presented is tentatively entitled, "The relation between oceanographic conditions and larval anchovy food in the California Current: Evidence of an anchovy recruitment failure." This paper is to be published in the proceedings of the Symposium.

Histological Studies of Development and Starvation in Anchovy and Pacific Mackerel Continue

Fishery Biologist Charles O'Connell of La Jolla reports that in February processing of anchovy and Pacific mackerel larvae continued for histological studies of development and starvation. The developmental series for both species were augmented by filling certain age gaps. For the anchovy, these gaps are in the 30 to 70 day range, when there are some major morphological advances.

For the starvation study, anchovies were obtained from two separate aquarium experiments. In one, periodic samples were taken and the progress of mortality followed in a population that was deprived of food after reaching an age of 20 days. The purpose is to document the development of histological symptoms of emaciation in relation to mortality for larvae that have advanced well beyond yolk absorption.

In the other, larvae were fed and starved through the period of yolk absorption and prepared for exploratory study of a special silver staining procedure. A recently described modification of one silver method was successfully used to demonstrate, in several animal tissues, early lesions of cellular degeneration that are not detectable with such routine stains as hematoxylin and eosin. The intensity of the reaction was correlated with the extent of cellular injury. The procedure was tried earlier on larvae that had been fixed and stored in formalin, but with negative results. This time, larvae were more suitably fixed in gluteraldehyde.

* * * * * * * * * * * *

Ms. G. Theilacker, Fishery Biologist at the La Jolla Laboratory, continued to evaluate and grade the histological features of fed and starved, laboratory-reared jack mackerel larvae. Also, several preserved plankton samples, collected at the same time that jack mackerel eggs were obtained, were sorted this month. Twenty jack mackerel larvae were isolated from the samples. The condition of the sea-caught larvae will be compared histologically to laboratory reared larvae (fed and starved) to determine the incidence of starvation and to evaluate whether starvation is one of the major causes of larval mortality. The wild larvae were treated using the histological procedures which had been defined for the laboratory-reared larvae. Not one of the resulting slides of the sea-caught larvae was acceptable. All treatments are now in the process of being re-evaluated. It appears that the staining technique needs to be adjusted.

Techniques Refined for Measuring Larval Fish Food "Patches" at Sea

Dr. Edward Scura, Physiologist at the La Jolla Laboratory, continued to study the causes of larval fish mortality at sea as part of an investigation sponsored by the Brookhaven National Laboratory of the Environmental Research and Development Agency. Techniques are being refined for measuring "patches" of larval fish food organisms at sea (i.e. micro-nauplii). A research strategy that is currently being tested involves pumping sea water from various depths in an effort to locate patches of organisms. A self-priming diaphragm pump is being tested on the theory that it will do less damage to micro-nauplii than a centrifugal pump. Also, the influent end of the sampling hose has

been fitted with a sensor that measures particles in the 50 to 500 m size range. The impulse from the particle sensor is transmitted through a cable to a recorder on board ship which indicates counting rate. The plan is to pass the probe down through the water column. If the recorder indicates an increase in the concentration of particles at a particular depth, a sample will be collected from the pump. The sample can then be examined in detail.

Larval Anchovy Model Simultaneously Simulates Contagion and Temperature Effects

The growth simulation model for larval anchovy developed by Dr. William Vlymen, NOAA Research Associate, was used to study the simultaneous effects of contagion in the prey distribution and temperature. Temperature coefficients occur in the model for swimming activity and basal metabolic rate. From the simulation, the highest growth rates occurred at the same level of contagion of food for all temperatures and the highest growth rates occurred at 14° C. For higher temperatures the growth rate declined monotonically until at 17° C the lowest growth rates occurred. This result contrasts to the laboratory where higher growth rates are observed at higher temperatures when food is unlimited. The discrepancy is believed to arise from the fact that in the model food is limited whereas in the laboratory it is not. In addition, the model utilizes a constant substrate conversion efficiency, which operates on the daily ration independent of temperature. In reality this term is most likely temperature dependent with high efficiencies occurring at higher temperatures, with a maximum at 17° or 18° C. The lack of appropriate physiologic data on this entity for larval fish precludes its inclusion in the present model but allows for its later inclusion when such data become available.

Also, Dr. Vlymen now plans to write a theoretical discussion of how this work may be interfaced with real environmental and biologic parameters to predict larval survival in the ocean. The method discussed will be motivated by the fact that the relationships elucidated represent deterministically the interactions between behavior and environment. These determinate relationships will then be expressed in an analogous way using formalism of stochastic processes.

INP-CalCOFI Egg and Larva Subcommittee Makes Recommendations for Cooperative Research Program in 1978

A meeting of the Egg and Larva Subcommittee of the Mexican Instituto Nacional de Pesca (INP) and CalCOFI met at the SWFC February 5, and a number of recommendations were made relative to cooperation between Mexico and the United States in stock assessment with egg and larva surveys. Attending the meeting were Dr. Reuben Lasker (Chairman),

Dr. Paul Smith (NMFS), Mr. Richard Schwartzlose (SIO), and Mr. Alejandro Villamar (INP). These recommendations were: 1) that a binational larval fish sorting center be established by mid-1977 in Ensenada, Mexico, in anticipation of the 1978 CalCOFI year, utilizing the resources currently available in both countries; 2) that steps be taken to improve the training of technicians to improve standardization of hydrographic data and that a special meeting be convened to discuss how this should be done; and 3) recognizing the need for oceanographic expertise in analyzing fisheries problems, that oceanographers be assigned specifically to the FAO-INP/CalCOFI biology groups.

Planning for 1977-78 cooperative cruises was discussed and a tentative plan for CalCOFI cruises was distributed to members of the subcommittee.

ECOLOGY OF THE CALIFORNIA CURRENT PROGRAM

Preparations Made for MARMAP Training Course on Identification of Fish Eggs and Larvae

Preparations for the MARMAP Training Course on Identification of Fish Eggs and Larvae, to be held at the La Jolla Laboratory, March 22 to April 16, continue to be one of the major activities of the program, according to Dr. Elbert Ahlstrom, Leader. The collections to be used in the course, which will cover 216 life history series, are being checked, and when necessary, replaced by more up-to-date material. Biological Technician Elizabeth Stevens has been chiefly responsible for this phase of preparation. The materials to be distributed to the class, which includes tables of meristic counts for the species to be studied each day, lists of selected references for each day, and illustrations for the majority of the series to be studied each day, have been assembled.

* * * * * * * * * * * *

Program Leader Elbert Ahlstrom reports that work continued on the identification of fish larvae taken on CalCOFI cruises. Ms. E. Sandknop, Biological Technician, has been working on identification of CalCOFI cruises 6912 and 7207. Neuston samples from cruise 7210 are being sorted by Curator Susan d'Vincent, who also is curating and reshelving portions of the reference collection. Ms. Barbara Sumida, Technician with the Smithsonian Institution, is working on flatfish larvae, particularly the heavily pigmented forms. Dr. Ahlstrom plans to include thise in a guide to identification of flatfish eggs and larvae of the eastern North Pacific.

Dr. H. G. Moser, Fishery Biologist, has been examining mid-water trawl collections of rockfishes (Sebastes spp.). Several types of rockfish juveniles occur consistently in these samples and he is attempting to identify them to species. One species, Sebastes melanostomus, has an unusual pattern of melanistic pigmentation and identification of a growth series of it from trawl samples has made it possible to recognize its earlier larval stages in CalCOFI plankton samples. A manuscript on the early life history of this species is in progress.

Oceanic Fisheries Resources Division

TUNA RESOURCES PROGRAM

Center Director Chairs Meeting of NMFS Tuna Policy Committee

Dr. Brian J. Rothschild, Director of the Southwest Fisheries Center, now on a 4-month detail in Washington, D.C. as Acting Director of the NMFS Extended Jurisdiction Planning Office, returned to La Jolla February 10 and 11 to chair a meeting of the NMFS Tuna Policy Committee. The primary objective of the meeting was to obtain views and reactions to the Committee's policy recommendations from spokesmen of the tuna industry and to enlist their participation in developing a comprehensive U.S. tuna policy.

Among the crucial items discussed at this meeting were the current U.S. Law of the Sea position on highly-migratory fish species, such as the tunas, structure and functioning of international tuna commissions, review of domestic legislation on extended jurisdiction, protection of U.S. fisheries on the high seas, NMFS/tuna industry cooperation on the porpoise/tuna interaction, and NMFS-industry relations.

1975 U.S. Atlantic Tuna Fisheries Statistics Sent to ICCAT

Mathematician Al Coan of the La Jolla Laboratory completed a preliminary report on 1975 Atlantic tuna statistics for U.S. purse seine fisheries for submission to the International Commission for the Conservation of Atlantic Tunas. Catches of yellowfin tuna accounted for approximately 60% of the 1975 catch of Atlantic tunas caught by U.S. purse seiners. The catch was made in the following regions of the Atlantic.

Ocean Region	Total Catch (metric tons) by Species									Number of Boats
	Yellowfin	Skipjack	Bigeye	Little Tunny	Auxis	Bluefin	Albacore	Other	Total	
Eastern Atl.	14,130	7,417	58	59			1	19	21,684	32
Gulf of Mexico									0	1
Mid-Western Atl.	270	49							319	10
North-Western Atl.						1,985			1,985	5
Southwestern Atl.									0	1
TOTAL	14,400	7,466	58	59	0	1,985	1	19	23,988	

Catch and effort data by 1° and 5° areas have also been compiled. Approximately 91% of the yellowfin catches and 63% of the skipjack catches were made in the Gulf of Guinea. Months of greatest catches were September and October for both yellowfin and skipjack.

Length-frequency samples, taken by the Inter-American Tropical Tuna Commission under NMFS contract, were used to estimate the length-frequency and total number of fish by species and area of the Atlantic. Distribution of the sampling effort by tonnage and number of fish samples were as follows:

Species/month	Eastern tropical Atlantic area			
	Gulf of Guinea		Angola	
	tonnage*	# of fish	tonnage*	# of fish
Yellowfin				
Jan.			43	150
Feb.	45	50		
Mar.	29	50		
July	204	251		
Aug.	312	350	62	50
Sept.	699	750	76	100
Oct.	826	855	6	50
Nov.	164	202		
Total	2279	2508	187	400
Skipjack				
Jan.			225	151
Feb.	68	50	35	50
July	85	150		
Aug.	78	150		
Sept.	216	450	69	100
Oct.	264	403	23	50
Nov.	73	200	73	100
Total	784	1403	425	451
Bigeye				
Sept.	15	50		
Oct.	11	50		
Total	26	100		
Little tunny				
July	5	50		
Aug.	5	50		
Sept.	36	100		
Total	46	200		

Species/month	Mid-Western Atlantic and Gulf of Mexico	
	tonnage*	# of fish
Yellowfin		
Sept.	21	50
Skipjack		
Aug.	46	50

*Metric

The results indicated that yellowfin catches from the eastern tropical Atlantic contained more fish (100 to 183 cm) than in 1974. However, age I fish (31 to 85 cm) dominated the catch in both 1974 and 1975. Approximately 63% of the yellowfin catch from the eastern tropical Atlantic in 1975 was age I fish. Skipjack length frequencies indicated that the dominant mode is age I fish (31 to 51 cm) which accounted for approximately 70% of the eastern tropical Atlantic skipjack catch.

Data Management System for Tuna Data

Mathematician Al Coan and Fishery Biologist Gary Sakagawa of the La Jolla Laboratory began organizing information for an evaluation of a data management system for tuna data. Data, data formats, and computer programs that are currently used at the laboratory were identified and cataloged. A computer systems expert has been contacted to assist in evaluation and formulation of a plan for the eventual design of an improved data management system.

Sampling of Foreign-Caught Atlantic Tunas - 1975

During the period April to December 1975, approximately 125 length-frequency samples of transshipped foreign-caught Atlantic tunas were obtained by SWFC Biological Technician Eugene Holzapfel in Puerto Rico. Coverage included samples from French, Ghanaian, Japanese, Korean, and Spanish vessels, primarily baitboats and seiners. The gear and number of fish sampled by species are:

Species	Tonnage sampled (metric tons)	Number of fish sampled	Gear
Albacore	3,606	643	Longline
Bigeye	221	125	Baitboat
Skipjack	6,475	2,322	Baitboat and seine
Yellowfin	2,682	3,642	Baitboat and seine
Total	12,984	6,732	

About 113 species composition samples, containing about 50 fish each, were taken in 1975. In landings marked as yellowfin tuna, the samples indicate that 1 to 16% of the catch was actually bigeye tuna.

Tuna Vessels Participate in FAX Program

During February, 32 U.S. tuna seiners participated in the FAX program of the La Jolla Laboratory. Reporting rates for January were up from February 1975 by 15.8%, as shown below:

February Reporting Rates

	Weather observations	XBT observations	Monthly total	Total - year to date
1975	269	47	316	734
1976	327	39	366	530
Percent change	+21.6%	-17.0%	15.8%	-27.8%

The increase in the reporting rate comes as a result of the movement of the fishery from off Ecuador northward to the traditional grounds off Central America. This has resulted in improved communications between the fleet and Commerce-licensed radio station WWD.

The tuna seiner Caribe led cooperating vessels in February with 68 weather observations sent to the Southwest Fisheries Center. The Caribe's reports composed 18.6% of the total number sent in and congratulations are due to Mr. Norman Head, Captain of the Caribe.

* * * * * * * * * * * *

During February, Dr. Nathan Clark continued his analysis of tuna harvests and the environment. Further analysis of the relationships between fishing success and environmental parameters in the eastern tropical Pacific tuna fishery using data from the first and second 3-month periods of the 1971-73 fishing seasons shows that: 1) there are significant correlations between catch-per-set, mean set size, successful set probability and catch-per-day with the surface environmental variables of wind speed, cloud cover, wave and swell heights and sea surface temperature; 2) there are significant correlations between the same fishery parameters in 1) and the subsurface variables mixed layer depths of the 60° and 74° F isotherms, and the average gradient in the thermocline.

Differences in the correlation results within and between the yearly fishing seasons indicates that no one environmental parameter (except possibly the average thermocline gradient) consistently influences fishing success in the eastern tropical Pacific tuna fishery.

TUNA/PORPOISE PROGRAM

Statistical Experts Examine Methodology for Comparison of Porpoise Mortality

A working group set up to examine the methodology for comparing the 1975 and 1976 porpoise mortality met at the Southwest Fisheries Center February 10-12, 1976. The group of statistical experts, chaired by Dr. Norman J. Wilimovsky, Institute of Fisheries, University of British Columbia, reviewed in detail the methodology designed by Mr. Gordon Broadhead of LMR, Inc., Dr. Douglas Chapman of the Marine Mammal

Commission, and Dr. William Fox, Chief of the Oceanic Fisheries Division at the La Jolla Laboratory. In addition to Dr. Wilimovsky, the working group consisted of Dr. Donald Hayne, North Carolina State University, Mr. Harry Saunders, NOAA, Dr. Morris Southward of New Mexico State University, and Mr. Norman Abramson, Director of the SWFC's Tiburon Laboratory.

The NMFS is committed by the 1976 porpoise/tuna regulations to announce in May 1976 whether or not the U.S. tuna fishing fleet has reduced its 1976 incidental porpoise mortality 30% below its 1975 level. If the reduction has not been attained, Director Schoning is empowered to establish a quota on incidental porpoise mortality for calendar year 1976 and to determine when the quota is reached.

NOAA Research Vessel Jordan Rescues Native Fishermen off Costa Rica

During the recently completed porpoise boundary cruise, the NOAA research vessel Jordan was involved in a dramatic sea rescue of two fishermen off Costa Rica.

According to Dr. Eric Barham, Leader of the scientific party aboard the Jordan, he was looking for marine mammals through a high-powered spotting scope, when he observed a small Costa Rican sailing craft in the Gulf of Nicoya, which appeared to be awash and its two occupants apparently in imminent danger of drowning.

Under the command of Captain Charles W. Forster, the Jordan slowed and changed course to approach the small boat. On cloaser inspection it was clear that the craft had foundered and its crew of two old men were signalling for aid. Captain Forster maneuvered the Jordan to bring the craft into position for rescue and a line was thrown. In reaching for the line, one of the men capsized the small craft, throwing both occupants and their gear into the water.

The fishermen, now clinging to the sides of their capsized boat, were only a few feet from the Jordan's side yet seemed incapable of reaching the nearby Jacob's ladder. One man appeared to be drowning even though his head was clearly out of the water. At this point, Seaman Barry Adams, who was attempting to aid them from the bottom of the Jacob's ladder, jumped into the water and assisted the man to the ladder which he managed to climb with the aid of helping hands from below and above. Once on deck the cause of his distress was made clear. Although unable to talk, he gestured to a tracheotomy incision in his neck through which he had been taking in water and from which the water was even now gushing. The man remaining in the water appeared even weaker and had to be raised to the deck of the Jordan by a line slung under his arms. It was subsequently discovered that this man was badly crippled and partially blind.

While the deck crew of the Jordan salvaged the fishing craft, other crew members administered medical attention and brought food, warm drinks, and blankets to the two fishermen.

With the aid of the winch aboard the Jordan, the small fishing vessel was righted and pulled up the stern trawling ramp and all baggage and equipment fished out of the water. During the short run to Puntarenas, the two men, Jose and Julio Aquilino, ages 81 and 77, respectively, explained to Dr. Barham that they were brothers. While attempting to cross the bay to the little village of Tambor after a shopping trip to Puntarenas, their vessel began taking on water. They had sat in their partially flooded craft for about 3 hours while several large fishing vessels passed close to them without taking notice of their plight. Captain Forster stated that it was certain these two senior citizens of Costa Rica would have perished at sea had they not been rescued by the Jordan.

The two old fishermen, dressed in oversized but dry clothes donated by the Jordan crew, were put ashore in Puntarenas in the pilot boat. When their craft was launched from the Jordan it immediately filled with water and was towed to the beach by the pilot boat. The Jordan then continued to the fuel dock to top off its supply of diesel for the return trip to San Diego.

NMFS-Tuna Industry Cooperate in Tests of Porpoise Saving Gear and Methods

During the fall of 1975, the purse seiner, Bold Contender, was chartered by NMFS to test several pieces of gear and methods to reduce incidental porpoise mortality. Since mortality was apparently greatly reduced during the testing period, NMFS and the tuna industry are jointly funding tests of the new gear to obtain sufficient data to substantiate its effectiveness in mortality reduction.

This month the B Street pier in San Diego was the scene of activity as NMFS gear technicians, under the direction of Mr. Richard McNeely, cut and laced 58 bales of tarred webbing into porpoise aprons and chutes and double depth safety panels for installation in purse seines. Twenty tuna purse seiners will participate in a series of test cruises, beginning in May 1976. This experiment is jointly funded by NMFS and the tuna industry-sponsored Porpoise Rescue Foundation and will help determine if the Bold Contender system does in fact significantly reduce mortality and also whether or not the apron and chute contribute significantly to that reduction

Two NOAA Research Vessels Complete Survey of Porpoise Distributions

The NOAA research vessels, Townsend Cromwell and David Starr Jordan arrived in San Diego on March 3 after completing a 2-month cruise to

explore the limits of the distribution of spotted and spinner porpoise in the area outside of the traditional tuna fishing grounds in the eastern tropical Pacific. Drs. Eric Barham and David Au, Cruise Leaders, are in the process of assessing the results, which will be used to refine estimates of population size of offshore spotted dolphin and eastern spinner dolphin.

TIBURON LABORATORY

COASTAL FISH COMMUNITIES INVESTIGATIONS

Numbers of Fishes Decrease with Seasonal Decline of Benthic Algae in Certain Nearshore Habitats

During this month Dr. Edmund Hobson, Project Leader, and Fishery Biologist Tony Chess, continued their study of fish collections made at Santa Cataline Island. At present they are assessing the impact of seasonal variations in benthic algal cover on the relative numbers of fishes. The study centers on the sand Bottom overgrown by brown algae, with Dictyopteris zonaroides predominating. This is a major nearshore habitat associated with the kelp forests in southern California, and, as reported last month, several important recreational fish species are most numerous in this habitat at certain periods during their lives.

Dramatic seasonal changes in this habitat relate to short-term invasions of other algal species. The appearance each spring of Sargassum muticum is striking. This large brown alga forms forests comparable to those of Macrocystis, but lasts only a few months. The demise of Sargassum follows shortly after a heavy overgrowth of the epiphytic alga Acinetospora nicholsonae inundates the area, covering not only the Sargassum, but also the Dictyopteris and other benthic species. There follows a drastic reduction in all algal forms, and correspondingly, a sharp drop in the numbers of fishes in the area.

PHYSIOLOGY INVESTIGATIONS

Experimental Designs for Striped Bass Mortality Study Nearing Completion

Details of the experimental designs for the striped bass mortality study are nearing completion. The initial experiments are designed to determine the optimal feeding conditions in terms of food types, sizes and concentrations. The principal variables to be monitored will be mortality, growth and development, behavior, feeding habits, and energy utilization.

Dr. Jeannette Struhsaker, Chief, Physiology Investigations, reported that in anticipation of the upcoming striped bass spawning season, the rearing and testing facilities are being modified to meet the requirements of the experiments.

Different food types are already being collected, isolated, and cultured. The population growth characteristics of four phytoplankters (Chlamydomonas sp., Chlorella, sp., Scenedesmus sp., and Nephroselmis sp.) and five zooplankters (Cyclops sp., Daphnia sp., Tisbe sp., Brachionus plicatilis and Neomysis sp.) are under study.

Stomach contents of field-caught striped bass larvae were identified and measured to determine the feeding preferences of different-sized larvae. The information will be used in the culture experiments for establishing the various food regimes for introduction of net food types.

COASTAL FISHERIES INVESTIGATIONS

Local Fisheries Development

A 2-week cruise is slated in September on the David Starr Jordan. The primary objective of the cruise is to assess the feasibility of trawling in deep waters off Pt. Conception--Morro Bay. Several local fishermen interested in the possibilities will be present during the cruise. Other aspects of the cruise will involve experimental fishing for rockfish, octopus, shrimp and California king crab. Project Leader Susumu Kato will attempt to integrate additional work contemplated by other investigators.

Recreational Rockfish Task - Contract for Rockfish Landings Sent to NASO

A contract with the California Department of Fish and Game was drafted and submitted to NASO in Seattle for implementation. The contract calls for the California Department of Fish and Game to sample partyboat and commercial landings of rockfish at Morro Bay, Monterey, San Francisco, and Fort Bragg.

Recreational Fisheries Improvement Task - Heavy Salmon Mortality Follows Pump Failure

Nearly all of the coho salmon (22,500) temporarily housed in two 10,000-gallon pools, were killed by oxygen depletion when the submersible pump, a Flygt Model B2120[1] broke down during the night of February 4. Fortunately, 1/4 of the fish (7,500) had been transferred the previous day to one of the floating pens just installed. These remaining fish should be more than sufficient for the planned tagging

[1]Mention of brand names does not necessarily imply endorsement by the National Marine Fisheries Service.

of 5,000 fish in March. These fish have grown, since their delivery last month, from an average of 62 grams to 93 grams. A second pen and floating walkway between pens was installed for use in tagging next month.

Final Editing of Anglers Guide to the U.S. Pacific Coast Nearly Completed

The Scientific Publications Staff (SPS, NMFS, Seattle) has nearly completed final editing of the Anglers' Guide manuscript. The Anglers' Guide, co-authored by James Squire, Fishery Biologist at La Jolla, and Susan Smith, Publications Specialist at Tiburon, describes marine game fish, fishing grounds and angler facilities all along the west coast from California to Alaska, and around Hawaii, American Samoa and Guam.

Ms. Smith received a list of comments on the manuscript from SPS and these are presently being reviewed. After some minor revisions are made, arrangements should begin for typesetting. Also, during the last month, last minute comments were received from Fred Berry (Southeast Fisheries Center, Miami Laboratory) concerning the carangid section of the Guide's list of fishes. These comments have been incorporated, and will also be sent to SPS in Seattle.

PUBLIC RELATIONS - SOUTHWEST FISHERIES CENTER

Tiburon Laboratory Director Norman Abramson addressed members of the San Francisco Tyee Club at their annual Inauguration and Awards Dinner on February 6.

* * * * * * * * * * * *

Fishery Biologist Richard Uchida of the Honolulu Laboratory served as Associate Judge of the Science and Engineering Research and Display projects at Leilehua High School on February 9 and at St. Francis High School on February 11.

* * * * * * * * * * * *

On February 15, Mr. Roger Green, Task Leader, Recreational Fisheries Improvement at the Tiburon Laboratory, together with Mr. Bruce Wyatt, University of California Sea Grant, participated in a Channel 2 TV "talk show" explaining their salmon rearing projects.

* * * * * * * * * * * *

Dr. R. Lasker of the La Jolla Laboratory lectured to a seminar at San Diego State University on February 20 on his recent work. He was host to the Marine Biology class from the California Polytechnical Institute at San Luis Obispo on February 21. Dr. Lasker also spoke at the laboratory of the Southern California Water Resources Research Project in El Segundo on February 17.

* * * * * * * * * * * *

On February 20 the following news release was issued by the Southwest Fisheries Center: "NOAA research vessel Jordan rescues native fishermen off Costa Rica."

HONORS AND AWARDS

Dr. Elbert H. Ahlstrom and Dr. H. Geoffrey Moser, Fishery Biologists at the La Jolla Laboratory of the Southwest Fisheries Center, were informed this month by Dr. Giles Mead, Director, of the extension of their appointments as Research Associates in Ichthyology of the Natural History Museum of Los Angeles County.

Dr. Reuben Lasker, Chief of the Coastal Fisheries Resources Division of the La Jolla Laboratory, received notification this month of his appointment to the Ocean Sciences Board. This group serves as the Chief Advisory Panel to the National Academy of Sciences on matters pertaining to oceanography as well as liaison between the national ocean science community and appropriate national and international bodies.

The following employees received length of service awards in February: Mr. Richard Shomura, Director of the SWFC Honolulu Laboratory, 25 years; Mr. Dan Gittings, Librarian, La Jolla Laboratory, 20 years; Mrs. Lillian Vlymen, Technical Writer/Editor, La Jolla Laboratory, 25 years.

On February 27, Mr. Shomura called a general staff meeting to announce the Honolulu Laboratory's nominees for the Federal Employee of the Year awards. Mrs. Lucille T. Tsukano was chosen in the non-supervisory category, and Mr. Heeny S. H. Yuen in the supervisory category.

Also at this meeting Mr. Shomura made superior performance awards to Mr. Ray Sumida and Dr. Jerry Wetherall, and special achievement awards to Messrs. Howard Yoshida and Richard Uchida.

SEMINARS

Honolulu Laboratory

February 11 - Dr. William W. Fox, Jr., Southwest Fisheries Center, spoke to an interested crowd in the seminar room of the Honolulu Laboratory on the subject "Porpoise research in the eastern Pacific Ocean."

La Jolla Laboratory

Dr. Jens G. Balchen, Professor of Engineering Cybernetics at the University of Trondheim, Norway, and visiting professor, University of California, Santa Barbara, visited the Southwest Fisheries Center early this month. On February 2 and 3 he presented a 2-day seminar on control theory in fisheries and its use in modeling biological situations: "Mathematical modeling, estimation and control of fish behavior. Discussion of a research program underway in Norway." Dr. Balchen expressed interest in a collaborative study with scientists at the Center, particularly in the area of stock and recruitment.

Tiburon Laboratory

February 20 - Mr. Chris Dewees, Sea Grant Marine Advisory Program, University of California, David, California spoke on "Activities of the Sea Grant Advisory Program."

MEETINGS AND TRAVEL

February 2 - Dr. Tom Nakayama of the University of Hawaii Food Science Department and Dr. Gilbert Stoewsand of Cornell University met with Mr. R. Shomura, Director of the Honolulu Laboratory to discuss histamine content in tunas.

2 - Ms. Linda Paul, University of Hawaii graduate student, discussed fishery resources problems in the northwestern Hawaiian Islands with Mr. Shomura and Dr. Paul Struhsaker.

5 - Jeannette Struhsaker, Mickey Eldridge, and Mike Bowers of the Tiburon Laboratory traveled to the University of California at Davis to visit with Joe Cech, Fish Physiologist, who is currently doing fish physiology experiments dealing with cardio-vascular system.

6-12 - Mr. R. Chris Fee, Area Personnel Officer, NMFS, Terminal Island, visited teh Honolulu Laboratory. He held interviews with laboratory employees February 9-12.

9 - Dr. R. Lasker, La Jolla Laboratory, was at the Brookhaven National Laboratory of ERDA to discuss the results of recent work he and his associates have done in the New York Bight with flatfish larvae. Preparations for the spring cruise on the R/V Palombo were made. Yellowtail flounder have been established in the Narragansett

Laboratory by Dr. Laurence and Ms. K. Dorsey and attempts will be made to spawn these and to use first-feeding yellowtail flounder larvae as a bioassay for larval feeding in the New York Bight.

9-13 - Norman Abranson, Director Tiburon Laboratory, traveled to SWFC, La Jolla, to participate in a statistical committee meeting to review methods for estimation of porpoise kill.

10 - Dr. William Fox, SWFC La Jolla, spent a few days in Honolulu meeting informally with laboratory staff members.

- Dr. John Randall, Bishop Museum, discussed with Mr. Shomura the possible transfer of a substantial part of the Honolulu Laboratory's fish collection to the Museum.

11-12 - Dr. R. Lasker attended a meeting of the Biological Oceanography Panel at the National Science Foundation in Washington. Sixty-five proposals in biological oceanography were reviewed by this panel. Earlier, Dr. Lasker met with the Director of the MESA project at the State University of New York in Stony Brook and with Dr. Arlene Longwell of NMFS Sandy Hook to discuss her project on chromosome breakage in fish embryos.

13 - Dr. Lasker attended a meeting of the Deep Ocean Mining Environmental Studies (DOMES) Advisory Panel in Washington, at the request of Dr. D. L. Alverson, member of the Panel.

- Mr. Shomura attended a meeting of the Pacific Islands Development Commission at the State Capitol.

16-17 - Mr. Shomura attended meetings of the Pacific Tuna Development Foundation held at the Ala Moana Hotel.

17-20 - Mr. Susumu Kato of the Tiburon Laboratory traveled to SWFC to attend a planning meeting on extended fisheries jurisdiction.

17-18 - Concept document prepared for fishery statistics under extended jurisdiction--Messrs. Gary Smith, Office of Resource Utilization, Washington, D.C., and Paul Hooker of the NMFS Southeast Region, St. Petersburg, met with SWFC Planning Officer David Mackett to develop a discussion paper for statistical and data management systems

(DMS) which will be required under extended fisheries jurisdiction. The concept document illustrated how a data management system would fit into an overall fisheries management system, detailed the various components of the system and indicated how it could be used in an efficient management information system.

The document has been sent to the various NMFS Regional and Center Directors with an extensive cover letter requesting detailed information needed to go from the general to specific regional systems. According to Mr. Mackett it is essential that first-cut regional views on the DMS be developed before further work is done to tackle the inter-regional problems and to set out final principles of operation. When the requested material is in hand from the Regions and Centers, an issue paper will be written that includes the considerations of each of the regional systems and the estimated budget and staffing required country-wide.

18 - Mr. Shomura met with Floyd Anders, Southwest Region.

19 - Mr. Allen Wolman, NWFC Marine Mammal Division, met with Mr. Shomura to review the NWFC's humpback whale survey in Hawaiian waters.

20 - Mr. Shomura called a meeting attended by representatives of the U.S. Fish and Wildlife Service, the State of Hawaii's Marine Affairs Coordinator's Office, State Fish and Game, Hawaii Institute of Marine Biology, and the Honolulu Laboratory to discuss the cooperative research activities for the northwestern Hawaiian Islands. Organization, funding, and research proposal schedules were discussed, resulting in improved understanding of the objectives of the various agencies.

24 - Dr. Jeannette Struhsaker and Mr. Mickey Eldridge attended the fourth meeting of the Striped Bass Conceptual Model Committee at the California Department of Fish and Game, Stockton, California. The four-agency committee reviewed the latest draft of the model and outlined the schedule for its completion and final presentation.

- Mr. Norman Abramson met with Patrick O'Brien and Gail Campbell, California Department of Fish and Game Ocean Salmon Project, to discuss methods of sampling landings to estimate recreational salmon catch.

24-26 - Mr. Susumu Kato attended the Sea Grant Scientific/ Technical Committee Meeting at Moss Landing to review work done on California squid.

VISITORS

Honolulu Laboratory

February 10 - Mr. Clifford T. Shoop, Department of Environment Canada, Nanaimo, B.C.

13 - Mr. Zenkuro Kawakami, Tokyo, Japan.

- Mr. Christopher Mitchell, Marine Resources Division, Trust Territory of the Pacific Islands.

18 - Mr. Bruce Morehead, NMFS, Washington, D.C.

- Mr. Craig Martin, La Jolla, California.

- Mr. Brent Berry, Friday Harbor, Washington.

La Jolla Laboratory (If not otherwise mentioned in text)

3 - Mr. Ron Keir, FAO, Mexico City.

5 - Mr. Peter Wadsworth, FAO, Mexico City.

23 - Miss Jane Stein, Newsweek Magazine.

Tiburon Laboratory

3 - Bruce Rodgers, Researcher, University of Rhode Island.

5 - Cari Spiller and Don Cameron, National Park Service, Point Reyes, California.

11 - Michael Herz, Oceanic Society, San Francisco, California.

- Michael Rafferty, San Francisco State University, San Francisco, California.

17 - Zeke Grader, Ocean Traders, Sausalito, California.

18 - James Mullick, U.S. Coast Guard, San Francisco, California.

- T. L. Thompson, U.S. Coast Guard, San Francisco, California.

20 - Chris Dewees, University of California, Davis, Sea Grant, Davis, California.

- Joe Cech, Fish Physiologist, University of California, Davis, Davis, California.

- Leslie Rowe and Martha Williams, Marin Museum, San Rafael, California.

- Margaret Bradbury, San Francisco State University, San Francisco, California.

25 - Marvin Moskowitz, Environmental Protection Agency, San Francisco, California.

27 - Dr. William Lenarz, Southwest Fisheries Center, La Jolla, California.

PERSONNEL

		Laboratory
February 9	- Christopher Psaropulos, Computer Programmer, Temporary Appointment.	La Jolla
9-13	- Training completed - Walburga L. Giguere, Administrative Officers' Seminar.	Tiburon
15	- Jo Medley, Secretary, Promotion	Tiburon
	- Peter Abbatello, Maintenance Mechanic, Pay Adjustment.	Tiburon
	- Mark Sweeney, Communications Specialist, Promotion.	La Jolla
17	- John Gilbert, Computer Programmer, Temporary Appointment.	La Jolla
23	- Kenneth Brennecke, Computer Programmer Temporary Appointment.	La Jolla
	- Danny Clevenger, Dale Powers, Gordon Armstrong, David Bratten, Charles Peters, Robert Hundt, James Sands, Jerome Myszka, Stephen Stangl, John Henderson, Marc Mallinkrodt, Edward Jameyson, Gerald Alisio, Robert Fountain, William Flerx and Frank Ralston, all Biological Technicians, Temporary Appointments.	La Jolla
27	- Kathryn Lewandowski, Secretary, Resignation.	La Jolla

February 29	- James Coe, Fishery Biologist, Promotion.	La Jolla
	- Merle Marrow, Maintenanceman, Promotion.	La Jolla
	- Edmond Ciarniello, Mathematical Technician, Temporary Appointment.	La Jolla
	- Atilio Coan, Mathematician, Promotion.	La Jolla

UNITED STATES
DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
8604 LA JOLLA SHORES DRIVE
P.O. BOX 271
LA JOLLA, CALIFORNIA 92038

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300
11ND-COM-2700/1 (REV. 6-75)

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
DEPARTMENT OF COMMERCE
COM-210

THIRD CLASS